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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/085,889

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Michael J. Rendon

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MOTOROLA INC
AUSTIN INTELLECTUAL PROPERTY
LAW SECTION
7700 WEST PARMER LANE MD: TX32/PL02
AUSTIN, TX 78729

EXAMINER

DIAZ, JOSE R

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 02/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/085,889	Applicant(s) RENDON ET AL.	
	Examiner José R Díaz	Art Unit 2815	<i>AW</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-2, 4-10, 12-19 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asakawa et al. (US Pat. No. 5,565,697) in view of Talwar et al. (US Pat. No. 6,300,208 B1), cited by applicant.

Regarding claims 1-2, 13, 16, and 19, Asakawa et al. teaches a method of forming a semiconductor device comprising the steps of: placing an energy absorbing layer (5) above the substrate (2) (see figs. 5 and 7); forming a semiconductor layer (14) above the energy absorbing layer (see fig. 5 and 7); forming a control electrode (40)

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(see figs. 5 and 7); forming first and second current electrodes (34, 36) within the semiconductor layer (14) (see figs. 5 and 7).

However, Asakawa et al. is silent with respect to the limitation of annealing or exposing the substrate to an energy source to electrically activate the source/drain regions. Talwar et al. teaches that ^{it} is well known in the art to activate the source/drain regions (5,6) by using a laser (10) (see fig. 2F and col. 7, lines 15-20) with a wavelength of 100-1200 nm (see col. 7, lines 18-21).

Asakawa et al. and Talwar et al. are analogous art because they are from the same field of endeavor as applicant's invention. At the time of the invention it would have been obvious to a person of ordinary skill in the art to anneal or expose the substrate to an energy source (e.g. a laser with a wavelength of 100-1200 nm) for electrically activating the source/drain regions. The motivation for doing so, as is taught by Talwar et al., is to activate the source/drain regions (col. 4, lines 26-33 and col. 7, lines 13-15). Therefore, it would have been obvious to combine Talwar et al. with Asakawa et al. to obtain the invention of claims 1-2, 4-10, 12-19 and 21-22.

Regarding claims 4-5, Talwar et al. teaches that is well known in the art to control the energy source by setting the wavelength of the light source to about 800 nm or more (see col. 7, lines 18-21).

Regarding claim 6, Talwar et al. teaches that is well known in the art to expose the energy-absorbing layer to an energy source (10) by positioning the energy source (10) to be above the integrated transistor device the substrate (2) (see fig. 2F).

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Regarding claim 7, Asakawa et al. teaches that the absorbing material (5) is made of, for example, tungsten and titanium (see col. 2, line 37-40).

Regarding claim 8, Asakawa et al. teaches that the semiconductor layer (14) has at least one of Si, Ge or GaAs (see col. 2, lines 35-36).

Regarding claim 9, Asakawa et al. teaches providing an insulating layer (38) between the energy absorbing layer and the control electrode (see figs. 5 and 7).

Regarding claims 10 and 17, Asakawa et al. teaches implementing the substrate as an insulator (4) (see figs. 5 and 7).

Regarding claims 12, 14 and 18, Asakawa et al. teaches the limitation of forming isolation regions (26, 30) (see figs. 5 and 7).

Regarding claim 15, Talwar et al. teaches that it is well known in the art to process a portion of the control electrode to comprise silicon having a higher melting temperature than the first and second current electrodes (see col. 5, lines 40-45) and processing the first and second current electrodes to comprise amorphous silicon (see col. 7, lines 7-12).

Regarding claim 21, Asakawa et al. and Talwar et al., as stated above, teach the claimed method of forming a device in which the source and drain regions are activated by a laser annealing step. With regards to the claimed resistivity, it is well known in the art that the resistivity of the source and drain regions is improved by laser annealing such regions. Thus, it would have been obvious to one of ordinary skill in the art to lower the resistivity from 0.1 ohm-cm to 0.001 ohm-cm, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in

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the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). The ordinary artisan would have been motivated to modify Asakawa et al. and Talwar et al. in the manner described above for at least the purpose of activating the source and drain region.

Regarding claim 22, Asakawa et al. further teaches an energy-absorbing layer of an electrically insulating material (4) (see figs. 5 and 7).

4. Claim 3, 11 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asakawa et al. (US Pat. No. 5,565,697) in view of Talwar et al. (US Pat. No. 6,300,208 B1), and further in view of Chan et al. (US Pat. No. 6,057,212).

Regarding claim 3, a further difference between the prior art and the invention is the limitation of bonding the semiconductor layer to the energy-absorbing layer. However, Chan et al. teaches that it is well known in the art to form the semiconductor layer by bonding the semiconductor layer (3) to the energy-absorbing layer (5) (see Fig. 1).

Asakawa et al., Talwar et al. and Chan et al. are analogous art because they are from the same field of endeavor as applicant's invention. At the time of the invention it would have been obvious to a person of ordinary skill in the art to further include the limitation of bonding the semiconductor layer to the energy-absorbing layer. The motivation for doing so, as is taught by Chan et al., is to provide a conductive layer that does not interfere with semiconductor manufacturing processes (col. 2, lines 10-14). Therefore, it would have been obvious to further combine Chan et al. with Asakawa et al. and Talwar et al. to obtain the invention of claims 3, 11 and 20.

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Regarding claims 11 and 20, Chan et al. further teaches providing an adhesion layer (325) between the energy-absorbing layer (4, 320) and the semiconductor layer (3, 335) (see Figs. 1 and 3).

Response to Arguments

5. Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references disclose the limitation of activating the source and drain regions by laser annealing: Sohn (US006475888B1); Yu (US006355543B1); Tsukamoto (US005401666A); and Mukai (US005264072A).

Correspondence

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (703) 308-6078 or (571) 272-1727, after February 9, 2004. The examiner can normally be reached on 9:00-5:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JRD

Tom Thomas